National Aeronautics and Space Administration

MARSHALL STAR

Serving the Marshall Space Flight Center Community

Jan. 27, 2011

Day of Remembrance: Message from the center director

On Jan. 27, 1967, fire claimed the crew of Apollo 1 during a test. We lost the crew of Space Shuttle Challenger during launch on Jan. 28, 1986. We lost Space Shuttle Columbia and its crew on Feb. 1, 2003 as they returned from space.

We set aside the last Thursday of each January to remember the 17 brave astronauts and the many others – civilian and military, in the air and on the ground, American and international – who made the ultimate sacrifice in the exploration of space. They were our heroes, our colleagues, our friends, and our family.

Spaceflight is inherently risky. No one understands that better than the Marshall team that has been harnessing the energy to carry humans into space for five decades. We have to accept that it comes with the job. But we should never accept the loss of life as inevitable.

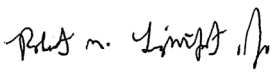
Behind every accident was a technical flaw, a piece of hardware that we fixed, returned to flight, and we never made the same mistake again. But technical solutions are relatively easy. The greater challenge is the common thread that links those tragedies – communications.

We have to work as a team to share technical information and concerns and be willing to ensure that there's no risk we don't fully consider and try our best to understand.

We have to excel technically as well as interpersonally, whether it's the final flights of a 30-year-old system like the Shuttle, or in the design process of a new heavy lift vehicle, or a piece of critical hardware for the International Space Station.

Robert Lightfoot

Please pause for a moment today to remember the men and women of Apollo 1, Challenger, Columbia, and the many others and honor their sacrifice by giving your best every day and by continuing the exploration that they furthered.



Robert Lightfoot
Marshall Center Director

NASA's first solar sail NanoSail-D deploys in low-Earth orbit

By Kim Newton

On Jan. 21 at 9 a.m. CST, engineers at the Marshall Space Flight Center confirmed that the NanoSail-D nanosatellite deployed its 100-square-foot polymer sail in low-Earth orbit and is operating as planned. Actual deployment occurred on Jan. 20 at 9 p.m. and was confirmed Jan. 21 with beacon packets data received

*See **NanoSail-D** on page 6*

Day of Remembrance ceremony to be held Jan. 27

Marshall team members are invited to a Day of Remembrance ceremony at 10:15 a.m. Jan. 27 in Building 4200, Morris Auditorium. The ceremony will honor the Apollo 1, Challenger and Columbia crews, as well as other members of the NASA family who lost their lives supporting NASA's mission of exploration and discovery. All employees are encouraged to attend.

Colonel James Halsell, Jr., USAF, Retired, former NASA astronaut and now Vice-President, Safety and Mission Assurance, Propulsion Systems, ATK, will be the guest speaker. Mr. Halsell has the distinction of having flown five space shuttle missions and led NASA's Space Shuttle Return-to-Flight Planning Team following the Columbia accident.

Employees will be asked to observe a moment of silence at the appropriate time during the ceremony. The U.S. flag will be flown at half-staff during the day.

Bus transportation will be available. Please see Inside Marshall for the bus schedule. The program will also be carried centerwide via Marshall TV and Desktop TV.

NASA satellites find high-energy surprises in 'constant' Crab Nebula

NASA news release

The combined data from several NASA satellites has astonished astronomers by revealing unexpected changes in X-ray emission from the Crab Nebula, once thought to be the steadiest high-energy source in the sky.

"For 40 years, most astronomers regarded the Crab as a standard candle," said Colleen Wilson-Hodge, an astrophysicist at the Marshall Space Flight Center who presented the findings recently at the American Astronomical Society meeting in Seattle. "Now, for the first time, we're clearly seeing how much our candle flickers."

The Crab Nebula is the wreckage of an exploded star whose light reached Earth in 1054. It is one of the most studied objects in the sky. At the heart of an expanding gas cloud lies what's left of the original star's core, a superdense neutron star that spins 30 times a second. All of the Crab's high-energy emissions are thought to be the result of physical processes that tap into this rapid spin.

For decades, astronomers have regarded the Crab's X-ray emissions as so stable that they've used it to calibrate space-borne instruments. They also customarily describe the emissions of other high-energy sources in "millicrabs," a unit derived from the nebula's output.

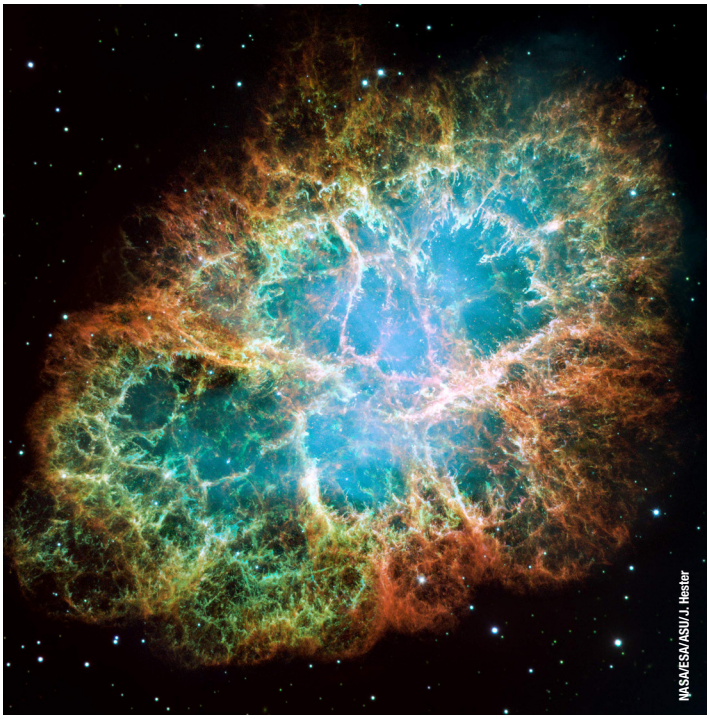
"The Crab Nebula is a cornerstone of high-energy astrophysics, and this study shows us that our foundation is slightly askew," said team member Mike Cherry at Louisiana State University in Baton Rouge. The story unfolded when Cherry and Gary Case, also at LSU, first noticed the Crab's dimming in observations by the Gamma-ray Burst Monitor, or GBM, aboard NASA's Fermi Gamma-ray Space Telescope.

The team then analyzed GBM observations of the object from August 2008 to July 2010 and found an unexpected but steady decline of several percent at four different "hard" X-ray energies, from 12,000 to 500,000 electron volts, oreV. For comparison, visible light has energies between 2 and 3 eV.

With the Crab's apparent constancy well established, the scientists needed to prove that the fadeout was real and was not an instrumental problem associated with the GBM. "If only one satellite instrument had reported this, no one would have believed it," Wilson-Hodge said.

So the team amassed data from the fleet of sensitive X-ray observatories now in orbit: NASA's Rossi X-Ray Timing Explorer and Swift satellites and the European Space Agency's International Gamma-Ray Astrophysics Laboratory. The results confirm a real intensity decline of about 7 percent at energies between 15,000 to 50,000 eV over two years. They also show that the Crab has brightened and faded by as much as 3.5 percent a year since 1999.

The scientists say that astronomers will need to find new ways to calibrate instruments in flight and to explore the possible effects of the inconstant Crab on past findings. A paper on the results will appear in the Feb. 1 issue of The Astrophysical Journal Letters.



This view of the Crab Nebula in visible light comes from the Hubble Space Telescope and spans 12 light-years. The supernova remnant, located 6,500 light-years away in the constellation Taurus, is among the best-studied objects in the sky.

Fermi's other instrument, the Large Area Telescope, has detected unprecedented gamma-ray flares from the Crab, showing that it is also surprisingly variable at much higher energies. A study of these events was published Jan. 6 in Science Express.

The nebula's power comes from the central neutron star, which is also a pulsar that emits fast, regular radio and X-ray pulses. This pulsed emission exhibits no changes associated with the decline, so it cannot be the source. Instead, researchers suspect that the long-term changes probably occur in the nebula's central light-year, but observations with future telescopes will be needed to know for sure.

This region is dominated by four high-energy structures: an X-ray-emitting jet; an outflow of particles moving near the speed of light, called a "pulsar wind"; a disk of accumulating particles where the wind terminates; and a shock front where the wind abruptly slows.

"This environment is dominated by the pulsar's magnetic field, which we suspect is organized precariously," said Roger Blandford, who directs the Kavli Institute for Particle Astrophysics and Cosmology, jointly located at the Department of Energy's SLAC – short for Stanford Linear Accelerator Center – National Accelerator Laboratory and Stanford University in California. "The X-ray changes may

*See **Crab Nebula** on page 5*

Marshall Association awards scholarships to four members' dependents

By Rick Smith

The Marshall Association, a professional, employee service organization at the Marshall Space Flight Center, has awarded scholarships to four children of association members, now first-year college students around the Southeast United States.

Samantha Frederick of Rogersville, Ala.; Olivia Grubbs of Hazel Green, Ala.; and Kayla Tickles and Eric Turner of Huntsville – all 2010 high school graduates – received a combined $4,200 in scholarships.

The Marshall Association, which includes civil service employees, retirees and contractors, provides informal networking and community-building opportunities for members. In addition to the annual college scholarship competition, it sponsors a speaker program addressing topics of interest to Marshall Center workers.

The association's scholarship awards are primarily funded from membership dues. It selects recipients based on grade-point averages, honor awards, extracurricular activities and ACT/SAT scores.

Frederick, the daughter of Kenneth and Lorraine Frederick of Rogersville, graduated from Lauderdale County High School in Rogersville. She now attends Mississippi State University in Starkville, where she is studying to become a civil or mechanical engineer. Her father is an electronics engineer in the Systems Development, Integration & Test Division of the Marshall Center's Engineering Directorate.

Grubbs, the daughter of Rodney and Shannon Grubbs of Hazel Green, graduated from Hazel Green High School. She is pursuing a career as a veterinarian for domestic animals at the University of Alabama in Tuscaloosa. Her father is manager of NASA's Digital Television Program at Marshall.

Tickles, the daughter of Dr. Virginia and Jordan Tickles of Huntsville, graduated from Buckhorn High School in New Market. She is attending Hampton University in Hampton, Va., studying secondary mathematics education. Her mother is an aerospace engineer in the Engineering Cost Office in Marshall's Office of Strategic Analysis & Communications.

Turner, the son of Susan Turner and Jim Turner of Huntsville, graduated from Randolph School in Huntsville. With plans to become a neurosurgeon, he is attending Vanderbilt University in Nashville, Tenn. His mother is the program manager for technology demonstration missions at Marshall. His father is deputy manager of the Spacecraft & Vehicle Systems Department in Marshall's Engineering Directorate.

Smith, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

NASA invites public to vote on OPTIMUS PRIME student video contest

NASA news release

NASA has opened online voting for the agency's OPTIMUS PRIME Spinoff Award student video contest. The public is invited to vote for its favorite videos, made by students in grades three through eight, developed to help educate America's youth about the benefits of NASA's technologies.

NASA is using the correlation between Hasbro's TRANSFORMERS property and commercialized agency "spinoffs" to help students understand how technology developed for space and aeronautics "transforms" into what is used on Earth.

More than 190 children from 31 states have submitted creative videos describing their favorite agency technology from NASA's 2009 Spinoff publication. The students also documented why their video should be selected to win the NASA OPTIMUS PRIME trophy.

The public can vote for their favorite OPTIMUS PRIME Spinoff Award videos online at http://ipp.gsfc.nasa.gov/optimus/voting.php.

The top five submissions from each of two groups – third through fifth and sixth through eighth grades – will advance for final judging. The voting process is open until Feb. 6.

A panel of NASA judges will select the winners in each of the two grade categories. The winning students, associated spinoff companies and NASA innovators will be announced in February.

In addition to the trophy, the winners will travel to Colorado Springs, Colo., for an award ceremony during the 27th National Space Symposium on April 12.

NASA intends to make this an annual competition. Students can begin thinking about next year's competition by deciding which spinoffs they like best from NASA's recently published Spinoff 2010.

For more information about the NASA OPTIMUS PRIME Spinoff Award, visit http://ipp.gsfc.nasa.gov/optimus.

For more information about NASA spinoffs and technology transfer, visit http://www.sti.nasa.gov/tto/.

For more information about the 27th National Space Symposium, visit http://www.nationalspacesymposium.org/.

NASA's Office of the Chief Technologist is responsible for facilitating the transfer of technology from the space program to the marketplace and the American public.

Marshall launches new internal social media tool, ExplorNet

By Amie Cotton

On Feb. 1, Marshall Space Flight Center team members will have a new way to communicate and collaborate across the center with the launch of an internal social media tool called ExplorNet.

Think online professional networking. ExplorNet is a tool to increase collaboration across the center, communicate in real-time throughout the Marshall community and find expertise to effectively complete tasks. It's located behind the Marshall firewall and available to all Marshall civil servants and contractors.

"ExplorNet allows the entire Marshall team to create a more open dialog about what's happening at the center," said Jonathan Pettus, Marshall Chief Information Officer. "With over 500 million active users on public social networking tools like Facebook, ExplorNet is a new internal tool to communicate and share information in a similar medium that team members are already familiar with and actively using, while maintaining a secure location behind Marshall's firewall."

ExplorNet is built around profiles and communities. Unlike public tools, like Facebook, both the profiles and communities will only be visible by Marshall personnel. Each Marshall team member will automatically have a personal blog and a profile with general contact information generated from the NASA Enterprise Directory (NED). Team members are encouraged to add to their profile work experience, current tasks, education, interests, etc. Anyone can create and join various communities related to his or her projects, working groups, office, organization, area of expertise, interests, and other areas. The idea is to link up with those with similar areas of interest, to share knowledge – which can lead to increased trust, access to information, teamwork and diversity of ideas.

Pettus noted NASA is one of the first federal agencies to employ Web 2.0 tools for professional networking. In 2009, the Defense Department launched milBook and now has over 80,000 users while the State Department is beta-testing its new internal tool, StateBook, slated for launch later this year.

Access to ExplorNet is similar to access to Satern training: It requires no additional login or password on-center. To access ExplorNet off-site, an employee will have to enter his or her username and password. ExplorNet is not available to the public or other NASA centers; it is an internal collaboration tool within Marshall.

The Office of the Chief Information Officer is offering training to all Marshall team members via tutorials and videos within ExplorNet as well as instructor-led classes via Satern. In addition, OCIO is offering monthly lunch-and-learn meetings centered around the culture that supports collaboration called Conversation Cafes.

ExplorNet experts also are available to speak at staff meetings, department all hands and other team meetings to provide customized information on how ExplorNet can work for your office and support your initiatives, as well as how to work more collaboratively and efficiently using ExplorNet's capabilities.

ExplorNet will be available Feb. 1 at http://explornet. For more information, contact Bernadette Buzzell at 256-544-7076 or Kevin Jones at 256-961-4350.

Cotton, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

'Focus on Marshall' features 'Hardware in a Loop,' Solar Wind Test Facility and ExplorNet

By Lori Meggs

You've heard them all, Facebook, Twitter, blogs, but now there's a new one – ExplorNet.

On the January episode of "Focus on Marshall," the Marshall Space Flight Center's video program, viewers will learn about this new social networking tool for employees.

In addition, the "Focus on Marshall" team will take viewers to Marshall's Propulsion Research Development Lab to learn about a technology that can help test and model just about any launch vehicle imaginable in the "Hardware in a Loop Lab."

And "Focus on Marshall" goes inside Marshall's Solar Wind Test Facility to discover how the center is supporting the Solar Probe Plus program – an ambitious mission to our very own star – the sun.

"Focus on Marshall" airs on Marshall TV Jan. 27 and Feb. 8 and 10 at 11 a.m., noon and 1 p.m. The series is available on NASA TV, Inside Marshall and on the NASA Portal.

Meggs, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

Crab Nebula *Continued from page 2*

involve some rearrangement of the magnetic field, but just where this happens is a mystery."

The Crab Nebula is a supernova remnant located 6,500 light-years away in the constellation Taurus.

NASA's Fermi is an astrophysics and particle physics partnership managed by NASA's Goddard Space Flight Center in Greenbelt, Md., and developed in collaboration with the U.S. Department of Energy, with important contributions from academic institutions and partners in France, Germany, Italy, Japan, Sweden and the United States.

The GBM Instrument Operations Center is located at the National Space Science Technology Center in Huntsville. The team includes a collaboration of scientists from the University of Alabama in Huntsville, the Marshall Center, the Max Planck Institute for Extraterrestrial Physics in Germany and other institutions.

Goddard manages Swift, Rossi X-Ray Timing Explorer and a guest observer facility for U.S. participation in the European Space Agency's International Gamma-Ray Astrophysics Laboratory mission.

For more information, images and animations on the Web, visit http://www.nasa.gov/fermi.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Marshall Star Ad Form." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue, Feb. 3, is 4:30 p.m. Thursday, Jan. 27.

Miscellaneous

Chain link dog kennel, 10'L x 10"W x 6'H, $100. 256-457-9126

Bruno ASL-400 wheelchair lift, $250; small parts organizers, $25. 256-783-3128

Sole E95 elliptical trainer, $1,000; Ab Lounge, $50. 256-424-3968

Two men's ski jackets, large, $50 each, Men's shell jacket, medium, $15. 256-882-3983

Gateway 20" widescreen LCD monitor, $75. 256-599-0209

Harmonix Rockband Drums, foot pedal/sticks, $65; Guitar Hero Fender Strat, $20; Xplorer guitar, $10. 256-464-5685

Copeland compressor from 3-ton central heat and air unit, $300. 256-708-7450

Solid oak antique-style bar, detachable top for transportation, photo available, $995. 256-653-4835

Stainless KitchenAid microwave oven, KHMS2040WSS, $375. 256-464-7894

Vented 24-inch natural gas logs, $150. 256-883-5168

Austin guitar, 3/4 (youth), hard case, strap, tuner, stand, beginner's book, $150. 256-509-0120

One-ton shop crane, $125. 256-837-4136

Sears Kenmore compactor, model 13605790, black, $200 obo. 256-653-7308

Large white couch, $100; Frigidaire washer & dryer, $100; GE microwave, $20; pictures available. 256-684-1513

Vehicles

2010 Ford F150 XLT Supercrew, silver exterior, gray interior, 5,500 miles, $24,000. 256-318-0078 or 256-895-0577

2007 Honda CRF 450X dirt bike, $3,500. 256-503-6812

2002 Honda Civic, $4,000. 256-990-4698

2002 Land Rover Discovery, tan interior/exterior, automatic, 78k miles, $7,500. 256-656-1146

1998 Stingray RS180, fish/ski, new 140hp, vests and other new equipment, $9,500 obo. 256-640-6427

1996 Roadtreck camper van 350, generator, toilet, microwave, TV, air, hitch, awning, 18,000. 256-572-0646

1986 190E Mercedes Benz, minor repairs, $700 obo. 256-852-8461

Wanted

Tickets to upcoming Beauty and the Beast performance at VBC. 256-708-7450

Houses/offices to clean. Available evenings/weekends. 256-777-8595 leave message

Cartop box for carrying skis, luggage, Thule, Yakima, etc. 256-227-0339

Adjustable dumbbell set, 25 lbs. max. each desired. 256-828-1234

NanoSail-D *Continued from page 1*

from NanoSail-D and additional ground-based satellite tracking assets. In addition, the NanoSail-D orbital parameter data set shows an appropriate change which is consistent with sail deployment.

"This is tremendous news and the first time NASA has deployed a solar sail in low-Earth orbit," said Dean Alhorn, NanoSail-D principal investigator and aerospace engineer at the Marshall Center. "To get to this point is an incredible accomplishment for our small team and I can't thank the amateur ham operator community enough for their help in tracking NanoSail-D. Their assistance was invaluable. In particular, the Marshall Amateur Radio Club was the very first to hear the radio beacon. It was exciting!"

NanoSail-D will continue to send out beacon signals until the onboard batteries are expended and can be found at 437.270 MHz. It can be tracked on the NanoSail-D dashboard at: http://nanosaild.engr.scu.edu/dashboard.htm.

It is estimated that NanoSail-D will remain in low-Earth orbit between 70 and 120 days, depending on atmospheric conditions. NanoSail-D is

NanoSail-D satellite during deployment testing.

designed to demonstrate deployment of a compact solar sail boom technology. This research demonstration could lead to further advances of this alternative solar sail propulsion and the critical need for new de-orbit technologies. This ejection experiment also demonstrates a spacecraft's ability, like the Fast, Affordable, Science and Technology Satellite, or FASTSAT, to eject a nano-satellite from a micro-satellite, while avoiding re-contact with the primary satellite.

"This is a significant accomplishment for both the FASTSAT and NanoSail-D projects. This accomplishment validates that we've met another of our primary mission objectives – successfully ejecting a nanosatellite from an orbiting microsatellite," said Mark Boudreaux, FASTSAT project manager at the Marshall Center. "This is another significant accomplishment for our inter Agency, Industry and Governmental FASTSAT-HSV01 partnership team."

The NanoSail-D satellite was jointly designed and built by NASA engineers from the agency's Marshall Space Flight Center in Huntsville, Ala., and NASA's Ames Research Center in Moffett Field, Calif.

Key sail design support was provided by ManTech/NeXolve Corp. in Huntsville. The NanoSail-D experiment is managed by Marshall. It is jointly sponsored by the Army Space and Missile Defense Command, the Von Braun Center for Science and Innovation and Dynetics Inc., all located in Huntsville.

Obituaries

Billy Frank Moultrie, 85, of Albertville died Jan. 11. He retired from the Marshall Center in 1973 as a quality assurance specialist. He is survived by his wife, Louise Moultrie.

Charles Pinson, 76, of Madison died Jan. 14. He retired from the Marshall Center in 1993 as an aerospace engineer supervisor. He is survived by his wife, Pam Pinson.

William Sutton, 77, of Huntsville died Jan. 15. He retired from the Marshall Center in 2004 as an engineer. He is survived by his wife, Julia Zeigler Sutton.

MARSHALL STAR

Vol. 51/No. 19

Marshall Space Flight Center, Alabama 35812
256-544-0030
http://www.nasa.gov/centers/marshall

The Marshall Star is published every Thursday by the Public and Employee Communications Office at the George C. Marshall Space Flight Center, National Aeronautics and Space Administration. Classified ads must be submitted no later than 4:30 p.m. Thursday to the Marshall Public and Employee Communications Office (CS20), Bldg. 4200, Room 102. Submissions should be written legibly and include the originator's name. Send e-mail submissions to: MSFC-INTERCOM@mail.nasa.gov. The Star does not publish commercial advertising of any kind.

Manager of Public and Employee Communications: Dom Amatore
Editor: Jessica Wallace Eagan

U.S. Government Printing Office 2011-723-031-00083

www.nasa.gov